

POLYPOIDAL CHOROIDAL VASCULOPATHY: SUCCESSFUL COMBINED THERAPEUTIC APPROACH A CASE REPORT

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ABSTRACT

Introduction: to report a case of PCV that has been successfully treated with intravitreal injection of t-PA, ranibizumab, and pneumatic displacement.

Method: A 65 years old man presented with blurred vision of his right eye. No systemic abnormalities were found. Initial visual acuity RE was 6/18. Funduscopy examination showed submacular hemorrhage in posterior pole. OCTA, FA and ICG confirmed the diagnosis of PCV. We performed anterior chamber paracentesis and intravitreal injection of 0,05 ml t-PA, 0,05 ml ranibizumab, and 0,3 ml 100% C3F8 at a time in retrobulbar anesthesia. The patient was instructed to maintain face down positioning for 2 days.

Results: We evaluated the visual acuity, central retinal thickness (CRT), and central pigment epithelial detachment (PED) thickness for 2 years. The visual acuity was increasing gradually from 6/18 to 6/6 in the first year. The hemorrhage was displaced completely, the CRT and central PED thickness were decreased. In the second year the patient had recurrence of PCV with serous retinal detachment and treated with intravitreal aflibercept.

Conclusion: Combined treatment of intravitreal t-PA, ranibizumab, and C3F8 can be used as a beneficial therapy for PCV.

Keywords: polypoidal choroidal vasculopathy, tissue plasminogen activator, anti-VEGF, pneumatic displacement.

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INTRODUCTION

Polypoidal choroidal vasculopathy (PCV) is a retinal disease characterized by multiple, serosanguineous detachment of the retinal pigment epithelium and neurosensory retina associated with secondary bleeding or leakage from the polypoidal lesions. It was originally described as an inner choroidal vascular abnormality with 2 distinct components of a network of branching vessels external to the choriocapillaris and terminal aneurysmal dilations sometimes seen clinically as reddish orange, spheroidal, polyplike structures or polypoidal vascular lesions.^{1,2} PCV likely comes in 2 varieties: a subset of choroidal neovascularization from a variety of causes, but most commonly attributable to neovascular age-related macular degeneration (AMD), or a distinct disease from AMD that is typically found in mostly darkly pigmented

younger individuals, and without other fundus findings typical of AMD.³ Subretinal hemorrhage and hemorrhagic PED occur more often in patients with PCV than in patients with typical neovascular AMD. Moreover, submacular hemorrhage also is a more common complication of PCV than of typical neovascular AMD.⁴

Several studies report that PCV have shown a prevalence of 22.3%–61.6% among Asians and 8%–13% in Caucasians who present with presumed neovascular AMD. There is a marked male preponderance of 63%–78.5% and only 5.9%–24.1% have bilateral disease.⁵ Indocyanine green angiography traditionally has been the gold standard investigation tool used to diagnose PCV. Single or multiple polyps can be seen in the early phase of ICGA.

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As noted, both flash digital fundus photography ICGA or the confocal scanning laser ophthalmoscope systems can detect at least 80% of the typical nodular lesions of the PCV, although the BVN and other features may be visualized better with confocal scanning laser ophthalmoscopy. In the absence of ICGA, differentiating PCV from typical AMD remains challenging. Other controversies remain as to whether PCV belongs to the AMD spectrum, because several hallmarks of AMD, including drusen, pigmentary changes, and atrophy, are relatively uncommon in PCV.⁶

The treatment modalities for PCV are photodynamic therapy, intravitreal anti-VEGF, laser photocoagulation,

pneumatic displacement, tissue plasminogen activator (t-PA), and vitrectomy. We report a case of PCV that has been treated with intravitreal ranibizumab, pneumatic displacement and t-PA.

CASE REPORT

A 65 years old man presented with blurred vision of his right eye. No systemic abnormalities were found. Initial visual acuity RE was 6/18. Fundoscopy examination showed submacular hemorrhage in posterior pole. OCT showed PED and serous retinal detachment (SRD), FA and ICG showed leakage and polypoidal lesion that confirmed the diagnosis of PCV.

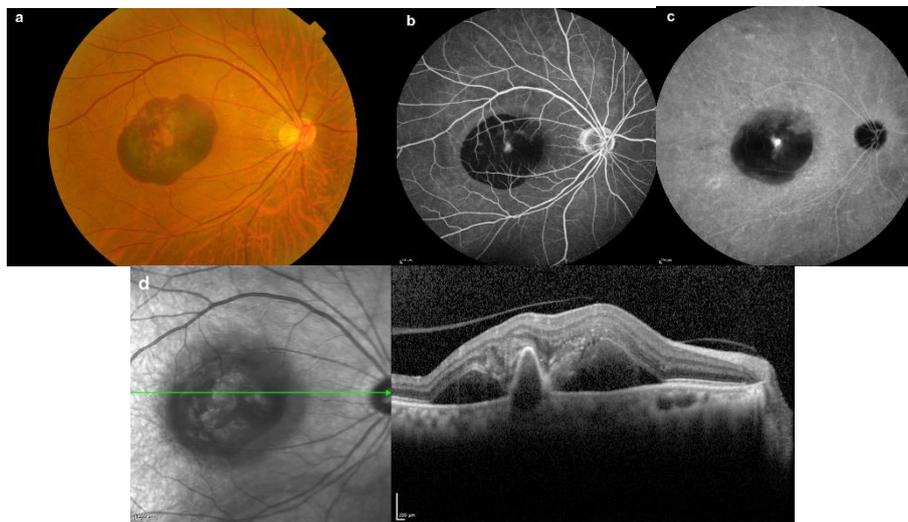


Figure 1. A 65 Years Old Man Presented with Blurred Vision A. Color Fundus Photography Showed Submacular Hemorrhage B. Leakage in Fluorescein Angiography C. ICG Showed Polyp, Pulsation (+) D. OCT Showed PED And SRD

We performed anterior chamber paracentesis (0,3 ml) and intravitreal injection of t-PA (25 µg/0,05 ml, 40,000 IU), ranibizumab (0,5 mg/0,05 ml), and 0,3 ml 100% C₃F₈ at a time in retrobulbar anesthesia. The patient was instructed to maintain face down positioning for 2 days. We evaluated the visual acuity, central retinal thickness (CRT), and central pigment epithelial detachment (PED)

thickness in 1 week, 1 month, 3 months and 1 year after treatment. The visual acuity was increasing gradually from 6/18 to 6/6 in the first year. The hemorrhage was displaced completely, the CRT and central PED thickness were decreased. There are no adverse events occurred due to the treatment.



Figure 2. Colour Fundus Photography Showed Improvement and Hemorrhage Displacement After Treatment A. 1 Week B. 1 Month C. 3 Months D. 1 Year

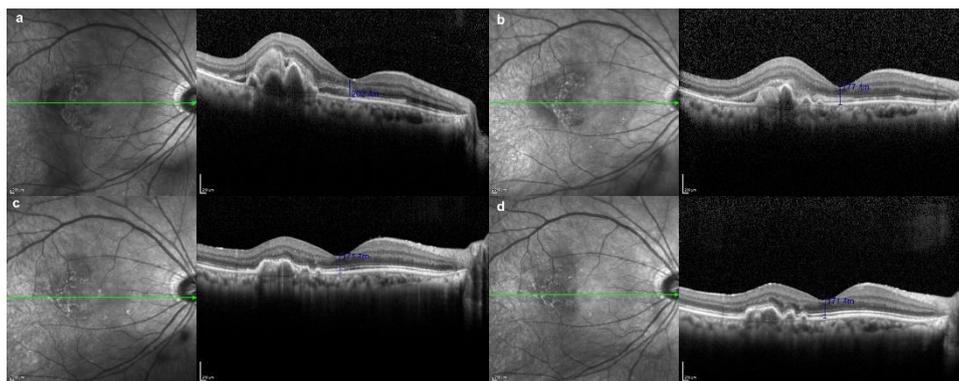


Figure 3. OCT Showed Decreased Central Retinal Thickness and Central PED Thickness After Treatment A. 1 Week B. 1 Month C. 3 Months D. 1 Year

In the second year the patient had recurrence of PCV with serous retinal detachment and treated with intravitreal aflibercept.

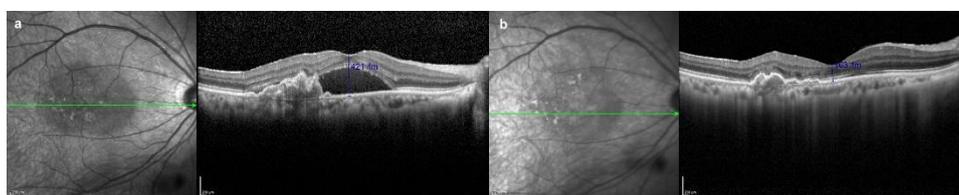


Figure 4. Recurrence Of PCV After 2 Years Treatment A. SRD and Increasing Central Retinal Thickness B. 3 Months After Intravitreal Aflibercept

DISCUSSION

The incidence of PCV in Japanese appears to be remarkably high. Clinical studies from Japan indicate that 54.7% of patients have PCV in neovascular age-related macular degeneration. This figure, however, could be an underestimation of PCV in this population, which could contain a significant number of asymptomatic subjects with PCV in a regressed or quiescent stage. The age of diagnosis can range from the 20s to the 80s, but PCV is most commonly diagnosed between the ages of 60 and 70 years. Initially PCV had been thought to be a condition exclusively found in women. However Asian PCV studies suggest that PCV is more common in males than females. Reported male : female ratios include 3,7:1 in Korean, 2,2:1 in Chinese, and 3,5:1 in Japanese. The reason for these epidemiologic differences in sex, unilaterality, and location in the different ethnic groups is not known.^{7,8,9,10}

In our case we report a male, in 60s with unilateral blurred vision because of PCV. The clinical presentation that we found is mild decreased visual acuity and submacular hemorrhage in posterior pole. The principal clinical manifestations secondary to PCV are seen in the posterior segment. Variably sized serous and serosanguineous detachments of the neurosensory retina and pigment epithelium around the optic nerve or in the central macula are the most frequent presentation. The typical presentations for a patient who is symptomatic for less than three months is extensive subretinal exudation and bleeding with minimal cystic change in the retina and

a surprisingly good visual acuity. This difference between the severity of the serosanguineous detachments and good vision is explained by the minimal intraretinal changes.^{2,6}

In the early phase of ICGA, pulsation of polypoidal vessels may sometimes be observed. Seven of 74 patients (9.5%) with PCV had pulsatile polypoidal vessels in the macula. Pulsations is a characteristic feature of PCV that is best appreciated by a dynamic video angiography system and missed in a flash imaging system. This could present as an important distinction from neovascular AMD and indicates arterial involvement and increased intravascular pressure transmitted from the inner choroidal vasculature.¹¹

Kokame et al report that continuous monthly intravitreal ranibizumab in eyes with active PCV shows stabilisation of vision, resolution of subretinal haemorrhage and a decrease in macular oedema. Monthly intravitreal injection of ranibizumab for 3 months has a short-term beneficial anatomic effect by disappeared polyp, decreased retinal thickness, reduction of subretinal fluid and PED.^{12,13}

Treatments for submacular hemorrhage with intravitreal rTPA and expansive gas injection have shown promising results. However, in case of submacular hemorrhage positioned primarily superior to or close to the foveola, this therapeutic method may not be performed because additional central visual loss may occur by shifting more

blood into the central macular area. Moreover, complication of pneumatic displacement with or without vitrectomy include vitreous hemorrhage, endophthalmitis, retinal detachment, and recurrence of submacular hemorrhage.

Guthoff et al report that there is a strong indication that the addition of intravitreal bevacizumab is safe and superior to the displacement of submacular hemorrhages alone with rTPA and gas. After 7 months post treatment, best-corrected visual acuity was significantly higher in the bevacizumab/rTPA/gas group than rTPA/gas group.¹⁴ In this case we treated the patient with combination of intravitreal ranibizumab, t-PA and gas injection. Subretinal hemorrhage treatment by non-vitrectomized technique with intravitreal injection of rt-PA, ranibizumab, and gas is useful to achieve hemorrhage displacement, lesion and visual improvement in 6 months.¹⁵

In this case, two years post treatment we found serous retinal detachment in OCT indicating that the patient had recurrence of PCV. We treated with intravitreal aflibercept injection pro re nata and after 3 months the SRD was resolved. Gomi *et al* reported that 5,6% patients had recurrence of PCV after photodynamic therapy.¹⁶ Kitagawa *et al* reported that recurrence was observed in 10 eyes (50%) within 6 months after treatment intravitreal t-PA, ranibizumab and gas injection.¹⁵ Among giving treatment pro re nata and fixed interval dosing every 2 months injection, intravitreal aflibercept was well tolerated and improved the visual outcomes in patients with polypoidal choroidal vasculopathy as evaluated at 1 year follow up examinations.¹⁷

CONCLUSION

Combined treatment of intravitreal t-PA, ranibizumab, and C₃F₈ can be used as a beneficial therapy for PCV.

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